ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on the Transport of Dangerous Goods

Eighty-first session
Geneva, 25-27 October 2006
Agenda item 7

ANY OTHER BUSINESS

Application of sub-section 1.8.5.2

Transmitted by the Government of Belgium

1. Accident at the port of Antwerp, 4 March 2004

2. – Tractor + semi-trailer chassis;
   – 8,000-litre tank container transporting liquid bromine (UN No. 1744), density 3.1;
   – Filled to 90 per cent of capacity.

3. Circumstances:
   – Vehicle became unstable in 90° bend (at speed of 32 km/h);
   – Bolts attaching container to chassis tore off;
   – Protective cap over top-mounted loading/unloading hatches unable to withstand impact.

GE.06-24596 (E)
4. Consequences:
   - Discharge of bromine through hatches and loss of about 6,000 litres;
   - Evacuation of significant number of persons;
   - Closure of road network and complete stoppage of port traffic;
   - Soil pollution.

5. Cause of accident:
   - Excessive speed of vehicle (32 km/h);
   - Use of a semi-trailer with two axles and floor height of 1.40 m.

6. Comparative calculations of the stability of semi-trailers with two and three axles were performed by a Belgian manufacturer under the following conditions:
   - Identical floor height;
   - Fitted with identical 8,000-litre lead-lined tank container;
   - Loaded with 19,120 kg of bromine (UN No. 1744), density 3.1, equivalent to a load of 6,000 kg (tare weight of container) + 19,120 kg of bromine or 25,120 kg in total.

   The results indicated that:

   (1) The centre of gravity of the loaded semi-trailer shifted from 2,006 mm (two axles) to 1,943 mm (three axles) and the lateral stability, as per Rule 111, from 0.375 g (two axles) to 0.448 g (three axles);

   (2) When semi-trailer with three axles is filled with 23,560 kg of bromine (to 95 per cent of maximum capacity), centre of gravity is 1,964 mm and lateral stability is 0.442 g (these critical values offer greater security than corresponding values for two axles).

7. Proposed measures:
   - Use of a more stable container platform (maximum height ± 1.10 m, three axles);
   - Special training for drivers transporting high-density liquids.